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THESIS

HAS THE NAVY'S OPERATIONAL TEST AND
EVALUATION FORCE BECOME ANTIQUATED?

by

Lennart Wendel, Jr.

December 1986

Thesis Advisor:

John F. McClain

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T233069

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b RESTRICTIVE MARKINGS		
2a SECURITY CLASSIFICATION AUTHORITY			3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited		
2b DECLASSIFICATION/DOWNGRADING SCHEDULE			5 MONITORING ORGANIZATION REPORT NUMBER(S)		
4 PERFORMING ORGANIZATION REPORT NUMBER(S)			5 MONITORING ORGANIZATION REPORT NUMBER(S)		
6a NAME OF PERFORMING ORGANIZATION Naval Postgraduate School		6b OFFICE SYMBOL (if applicable) 54	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School		
6c ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000			7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000		
8a NAME OF FUNDING/SPONSORING ORGANIZATION		8b OFFICE SYMBOL (if applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c ADDRESS (City, State, and ZIP Code)			10 SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO	PROJECT NO	TASK NO
			WORK UNIT ACCESSION NO		
11 TITLE (Include Security Classification) HAS THE NAVY'S OPERATIONAL TEST AND EVALUATION FORCE BECOME ANTIQUATED?					
12 PERSONAL AUTHOR(S) WENDEL, Lennart Jr.					
13a TYPE OF REPORT Master's Thesis		13b TIME COVERED FROM TO	14 DATE OF REPORT (Year, Month, Day) 1986 December		15 PAGE COUNT 74
16 SUPPLEMENTARY NOTATION					
17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	OT&E, Acquisition, OPTEVFOR, OTEA, AFOTEC, Weapon System.		
19 ABSTRACT (Continue on reverse if necessary and identify by block number) The main thrust of this paper will be centered around the issue of whether the Navy should restructure the Operational Test and Evaluation Force (OPTEVFOR) along the lines of the Army's and Air Force's independent test agencies. The paper begins with an overview of the weapon system acquisition process. It then proceeds to demonstrate how test and evaluation (T&E) fits into the acquisition process. Finally, a description and evaluation of the each of the service's independent test agencies are presented. The researcher suggests that the perceived problems are not caused by OPTEVFOR's present structural arrangement, but are the result of OPTEVFOR's philosophy. The final conclusion is that OPTEVFOR should not change its existing structure, instead it needs to expand upon its current emphasis on increased communication.					
20 DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			21 ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a NAME OF RESPONSIBLE INDIVIDUAL CDR John F. McClain, III			22b TELEPHONE (Include Area Code) 408-646-2966	22c OFFICE SYMBOL 54MC	

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Has the Navy's Operational Test and
Evaluation Force Become Antiquated?

by

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Submitted in partial fulfillment of the
requirement for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1986

ABSTRACT

The main thrust of this paper will be centered around the issue of whether the Navy should restructure the Operational Test and Evaluation Force (OPTEVFOR) along the lines of the Army's and Air Force's independent test agencies. The paper begins with an overview of the weapon system acquisition process. It then proceeds to demonstrate how test and evaluation (T&E) fits into the acquisition process. Finally, a description and evaluation of the each of the service's independent test agencies are presented.

The researcher suggests that the perceived problems are not caused by OPTEVFOR's present structural arrangement, but are the result of OPTEVFOR's philosophy. The final conclusion is that OPTEVFOR should not change its existing structure, instead it needs to expand upon its current emphasis on increased communication.

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I. INTRODUCTION

Weapon system acquisition, the development and procurement of military systems, is a matter of widespread and increasing concern. Government Reports, Congressional hearings, as well as articles in the press, have suggested that the acquisition process is not working as well as it should. A few examples of these shortcomings are: that development fails to produce a satisfactory working design, that major systems incur large cost overruns, and that parts are over priced.

Testing of new weapon systems is one of the Department of Defense's (DOD) key controls in the process of acquiring these complex and expensive systems. Adequate test and evaluation (T&E) of these weapon systems is of paramount importance to ensure maximum return for the dollars spent to procure the systems.

Significant improvements have been accomplished in the test and evaluation portion of the acquisition process. In earlier years, test and evaluation was often accomplished when or where time allowed and usually by personnel who were not trained in the techniques of testing. After the July 1970 Blue Ribbon Defense Panel Reports, test and evaluation policies were significantly altered. Separate independent test agencies were established within each service. These agencies, although organized differently, had one thing in

common, each maintained its testing independent from the developer, reporting directly to its own service headquarters. These independent agencies perform what is commonly called Operational Test and Evaluation (OT&E). They check to see if and how well the system will function in an operational environment.

How Operational Test and Evaluation is being implemented has been one of the central issues identified in numerous committees, commissions and reports on weaknesses in weapon system acquisition. The issues addressed in these studies have been consistently repeated. A report done in February 1977 by the Defense Science Board identified one significant shortcoming in OT&E. The report stated that it is very important for all participants in the acquisition process to participate throughout the entire acquisition process. At the time of this report this interaction between the developer and service OT&E organizations did not exist. [Ref. 1: p.7]

Directives and instructions have been issued which should have corrected some of the major OT&E problems. These instructions however, have not been effectively implemented in the Navy, and this has resulted in the Navy's OT&E practices remaining essentially unchanged with little interaction between the developer and the independent operational test agency. This course of action has been one

of the reasons for an increase in the length of the acquisition process, which in turn has increased the overall costs of the process as well.

As a result of the Navy's reluctance for interaction, a question has been asked about the present structure of the Navy's independent operational test agency. This question is should the Navy restructure its Operational Test and Evaluation Force (OPTEVFOR) along the lines of the Army and the Air Force? Presently the Army and Air Force independent operational test agencies act as a manager, allowing the user to do the actual operational testing. The Navy's Operational Test and Evaluation Force on the other hand, acts as a surrogate for the fleet (user) and does all the Operational Test and Evaluation. It is felt by some, that by restructuring, the user's inputs could be introduced into the process on an earlier and continuous basis. The contention is that the restructuring would also enormously reduce the size and cost of OPTEVFOR and additionally would provide a trained first fleet unit at the end of the Operational Evaluation (OPEVAL). An additional potential benefit espoused would be an earlier Initial Operational Capability (IOC). [Ref. 2]

The main thrust of this thesis will center around the issue of whether the Navy should restructure OPTEVFOR along the lines of the Army and Air Force. However, before this

issue can be properly addressed, a foundation has to be laid. This foundation will consist of an overview of the weapon system acquisition process, how T&E fits into the acquisition process, and finally a description and evaluation of each of the service's independent test agencies.

II. DEFENSE ACQUISITION PROCESS

The issue of whether to restructure the Navy's Operational Test and Evaluation Force can not be properly addressed without a basic understanding of the DoD's weapon system acquisition process and how the Service's T&E program fits into the overall acquisition scheme.

The present method of managing the weapons systems acquisition process in the DoD, emerged as a result of a study by the President's Blue Ribbon Defense Panel (BRDP) done in 1970. As a result of recommendations of the BRDP, the Department of Defense Directive 5000.1 was promulgated and released in 1971. The next item to be released in this evolution was the issuance of Office of Management and Budget (OMB) Circular A-109, which was released in 1976. The policies and guidelines in these documents form the basis for all the subsequent directives and instructions regulating the acquisition of weapon systems. These directives and instructions enable the Secretary of Defense (SECDEF), who is aided by the Joint Requirements and Management Board (JRMB), formerly called the Defense System Acquisition Review Council (DSARC), to guide and control the development and production of major weapon systems through a series of acquisition phases, milestone reviews, and decision points. The process is illustrated in Figure 1 [Ref. 3:p. 6].

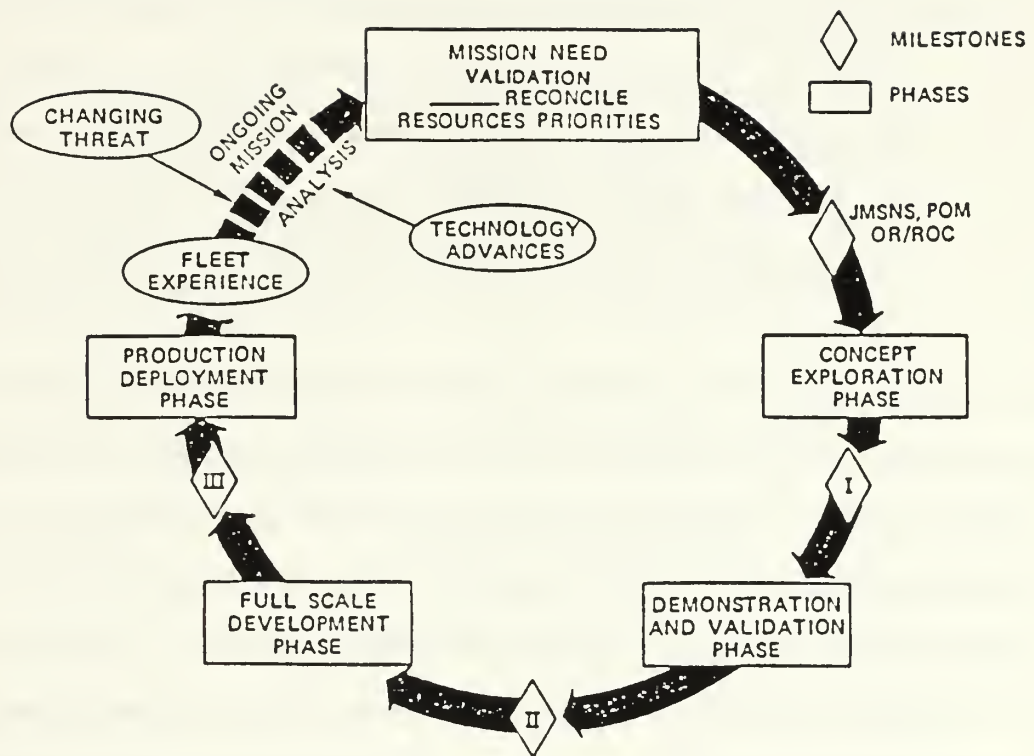


Figure 1 Acquisition Phases and Milestones

It is the Secretary of Defense who makes the decision as to which new systems will be designated a major system. The decision to designate any system as major is based upon:

- a. Development risk, urgency of need, or other items of interest to the SECDEF.
- b. Joint acquisition of a system by the DOD and representatives of another nation, or by two or more DOD Components.
- c. The estimated requirement for the system's research, development, T&E, procurement (production) and operation and support resources. A Justification for Major System New Start (JMSNS) is required for all acquisitions for which the DOD Component estimates cost to exceed \$200 million (FY80 dollars) in RDT&E funds or \$1 Billion (FY80 dollars) in procurement (production) funds, or both.
- d. Significant congressional interest.[Ref.4 : pp. 5-6]

It should be noted that all weapon systems acquisitions go through a similar process to the one outlined here for major systems. The only difference is that decisions are made at lower levels within the Services.

There are four distinct phases and milestones in the system acquisition process. The actual acquisition of a new system begins with either a decision to establish new capabilities in response to a technologically feasible opportunity, an identified deficiency in an existing capability, a significant opportunity to reduce the DoD cost of ownership, or in response to a change in the national defense policy [Ref 4: pp.3-4]. This part of the process is called Milestone 0.

By preparing a Justification for Major System New Start (JMSNS), the Services document the need for the new system and submit it into the Planning, Programming, and Budget System (PPBS) process along with the Service's Program Objective Memorandum (POM) for the year in which the funds are requested. The Secretary of Defense may then sanction the JMSNS in the Program Decision Memorandum (PDM). This action, designated Milestone 0, authorizes the Service to initiate the program when funds are available and moves the program into the next acquisition phase which is called Concept Exploration (CE).

In the Concept Exploration phase, several contracts are awarded to industry to identify and investigate alternative system design concepts that will satisfy the mission need. At the conclusion of this phase, the Program Manager (PM) makes his/her recommendation for those concepts which have the potential for further development and evaluation and should be carried forward into the next phase of the acquisition process which is called the Demonstration and Validation (D&V) phase. This recommendation is documented in the System Concept Paper (SCP).

The SCP is submitted to the Joint Requirements and Management Board (JRMB) and then forwarded, if approved, to the SECDEF. The SECDEF uses the SCP to make the Milestone I decision. The authority to proceed is provided in the

Secretary of Defense Decision Memorandum (SDDM). Approval signifies a validation of the requirement and is authorization to proceed with the D&V phase with the most promising concepts [Ref 4: p. 4].

An additional document developed during the CE phase, is the Test and Evaluation Master Plan (TEMP). The TEMP is a short, concise master plan for T&E. Its purpose is to identify all required T&E resources, facilitate long-range planning, programming, and budgeting including that of adequate numbers of test hardware items and specialized major range and test facilities, ensure accomplishment of adequate T&E, and eliminate redundant testing. The TEMP forms the basic contract between the Development Agency (DA) which is responsible for the Development Test and Evaluation (DT&E) and the independent test agency, who is responsible for the Operational Test and Evaluation (OT&E). While the initial version of the TEMP, which is required at Milestone I, will lack many specifics, through a continuous revision process the TEMP will develop the necessary detail. [Ref. 3:p. 3-19]

A positive Milestone I decision allows the system to enter the Demonstration and Validation phase. The purpose of this phase is to further develop and validate the alternative concepts to determine which concept(s) should progress into the Full Scale Development (FSD) phase [Ref.3: p.1-15]. This phase involves demonstration of the technology to be

used in the system or critical subsystems to verify performance and the potential suitability of the concept to fill the mission need. At this point, scientific and technological development is required to bring the concept to its fruition.

It is during the D&V phase that both DT&E and OT&E begin with the test results being used to support the Milestone II decision. Identifying critical issues and areas of risk that have been addressed by test and evaluation, the Decision Coordinating Paper (DCP)/Integrated Program Summary (IPS) is prepared by the Program Manager. The DCP/IPS provides the test objectives and measures of effectiveness related to the satisfaction of mission need and resource requirements that apply to the test activity. The PM submits the document through the JRMB to the SECDEF for the Milestone II decision. SECDEF approval authorizes the program to proceed into the Full Scale Development phase (FSD).

The purpose of the FSD phase is to produce a fully tested, documented, and production-engineered design of the selected concept [Ref. 3: p.1-15]. This phase is divided into three subphases: engineering, prototype, and pilot-production/transition to production. It is during this part of the acquisition cycle that two major evaluations take place. The first is the technical evaluation (TECHEVAL), the

purpose of which is to identify technical deficiencies and determine whether the design meets technical specifications and requirements [Ref. 5: p.2]. This evaluation is a very important facet of development testing, for if the system passes the TECHEVAL it goes on to the next major evaluation, which is called Operational Evaluation (OPEVAL). Given the data from the TECHEVAL, OPEVAL proceeds to test the system for demonstration of operational effectiveness and operational suitability, in addition to verification of fixes for problems discovered in the TECHEVAL [Ref. 5: p. 4]. These formal evaluations are performed in order to certify readiness for the production phase.

The final milestone decision point, Milestone III, is to decide whether or not the system is to enter into production and deployment. The PM documents the results of the FSD phase, including testing, and plans for future testing are assessed again. The PM then sends his recommendations in an updated DCP/IPS through the JRMB to the SECDEF for his decision. Normally, however, the Secretary of Defense delegates the Milestone III decision to the Secretary of the branch of the Service that is responsible for the system. For less than major systems, this decision in some cases is delegated to the lowest level in the organization at which overall view of the program rests. This is the point where test results play their most critical role because they

assist the decision maker in his decision whether to approve or deny production.

An affirmative Milestone III decision allows the system to enter the Production and Deployment Phase. One or more contractors are awarded a production contract for either low-rate or full rate production. Even after the system is being produced, testing does not stop. The system is assessed in new environments, in different platform applications, in new tactical applications, or against new threats.

Besides the aforementioned fixed milestones, additional program reviews can be held at any point in the program when major problems arise. Most of the information at the reviews comes from the test and evaluation results and is used to assess the programs progress and its likely success [Ref 6:p. 88]. Depending on the findings, a program may advance to the next phase, be canceled or just held at its present phase.

In summation, the acquisition process that is presented here is a very simplistic overview. This process, though conceptually simple, in fact is extremely detailed in its requirements. Test and evaluation is an essential player in the Department of Defense's acquisition process, in that the T&E results help to determine the future outcome of a program.

III. WHAT IS TEST AND EVALUATION ?

Test and evaluation is a fundamental and integral part of the acquisition process. Although the terms "test" and "evaluation" are used jointly, they do represent two distinct and unique functions. One definition of TEST is " a critical examination, observation or evaluation; a trial or group of trials" [Ref. 7:p. 2]. Evaluation, on the other hand concerns the review and analysis of data produced during testing or use of the item.

The Department of Defense is generally concerned with three types of test and evaluation: Development Test and Evaluation (DT&E), Operational Test and Evaluation (OT&E), and Production Acceptance Test and Evaluation (PAT&E) [Ref.8: p.2]. Figure 2 is a summary overview of the acquisition process, and it illustrates where these three types of test and evaluation fit into the acquisition process [Ref.3: p. 1-18].

A. DEVELOPMENT TEST AND EVALUATION (DT&E)

DT&E is that test and evaluation conducted to demonstrate that the engineering design and development process is complete, the design risks have been minimized, the system will meet the specifications, and to estimate the system's military utility when introduced [Ref. 9: p. 7-8]. Development Test and Evaluation is planned, conducted and

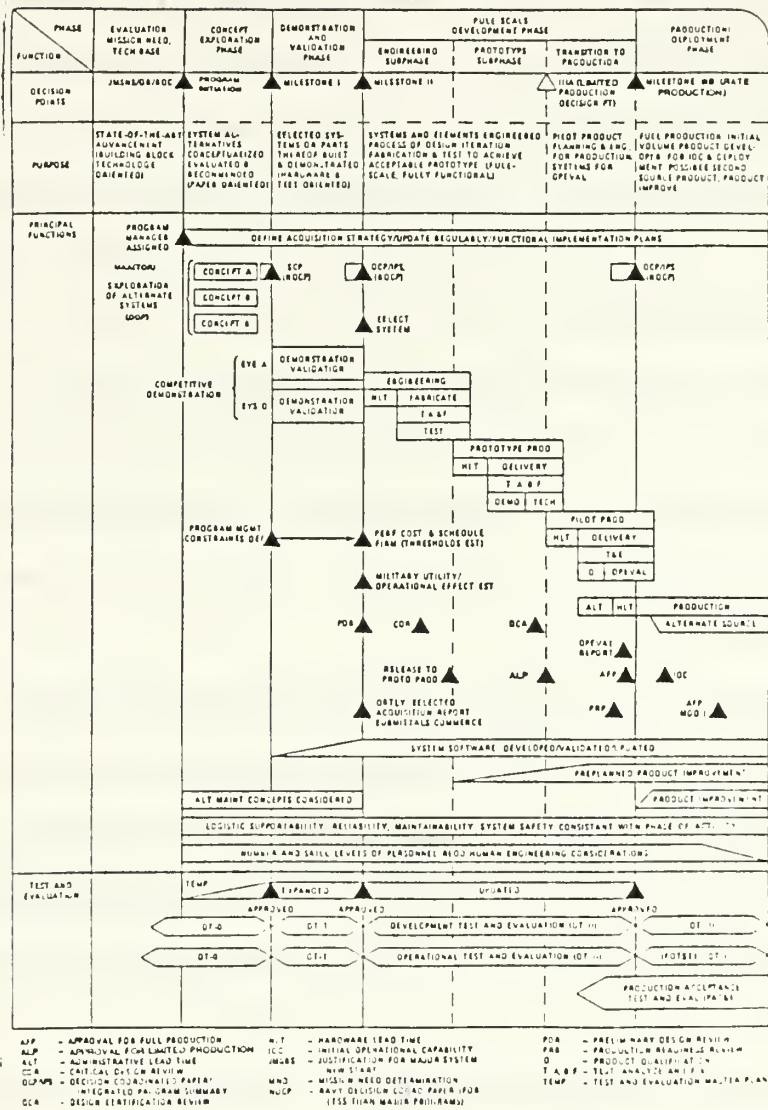


Figure 2. Summary Overview of the Acquisition Process.

monitored, by the Developing Agency (DA) of the Military Departments or other Defense Agencies, with the results being reported to the responsible Military Service Chief.

DT&E is required for all acquisition programs. It can be broken down into three major phases: DT-I, DT-II, and DT-III. The specific objectives of each phase are developed by the DA and are published in the Test and Evaluation Master Plan (TEMP).

DT-I is conducted during the Demonstration and Validation Phase to support the Milestone II decision. Its principal purpose is to demonstrate that all technical risks have been identified and that solutions to the risks are in hand [Ref. 9:p. 7-8].

Conducted during the Full Scale Development Phase, DT-II is used to support the production and deployment (Milestone III) decision. DT-II demonstrates that the design meets its specifications in performance, compatibility, supportability, survivability, safety, and human factors [Ref. 9: p. 7-9].

The Technical Evaluation (TECHEVAL) is the final phase of DT-II. It is conducted to determine whether or not a system is functioning in a technically acceptable manner, whether it meets technical and design performance specifications, and to determine if it is ready for the Operational Evaluation (OPEVAL). The Developing Agency (DA) has the

primary responsibility for planning the test program and obtaining their results. After the TECHEVAL, the DA certifies that the system is ready for the Operational Evaluation (OPEVAL). However, OPEVAL may not commence until the Secretary and the independent test agency of the concerned branch of the service accepts the DA's certification of readiness for OPEVAL. [Ref. 9: p. 7-9]

The final phase of DT&E is DT-III. It is conducted after the production and deployment decision (Milestone III). DT-III is used to verify the correction of design deficiencies found during TECHEVAL or OPEVAL, and that any improvements that were made to the system are effective.

B. OPERATIONAL TEST AND EVALUATION (OT&E)

Operational Test and Evaluation is the test and evaluation conducted by an independent agency to determine the prospective system's military utility, operational effectiveness (including compatibility, interoperability, reliability, and maintainability), and logistic and training requirements [Ref. 9: p. 7-9]. Since OT&E is conducted under as near to realistic operating conditions as possible, needed modifications to the system do become apparent during this process. The operating personnel, as well as required support facilities, are typical of those expected to operate and maintain the system when it is deployed.

OT&E can be broken down into two categories: Initial Operational Test and Evaluation (IOT&E), which is all OT&E conducted prior to the production and deployment decision, and Follow-on Operational Test and Evaluation (FOT&E), which is all OT&E which is conducted after the production and deployment decision. OT&E can also be divided into four phases (two in IOT&E and two in FOT&E).

OT-I is the first phase of Initial Operational Test and Evaluation (IOT&E), and is conducted during the Demonstration and Validation Phase to support the full-scale development decision (Milestone II). Its objectives are to provide an early assessment as to whether or not, based on the system's effectiveness, the project/program should continue on its development [Ref. 9: p. 7-9].

The other phase of IOT&E is called OT-II, and is conducted during the Full-Scale Development Phase. The OPEVAL is the culmination of OT-II. The objectives of OT-II are the demonstration of the achievement of program objectives for operational effectiveness and of operational suitability.

The first phase of Follow-on Operational Test and Evaluation (FOT&E) is called OT-III, and is conducted after the production and deployment decision. This testing is done before production systems are available. Normally it is done using the same preproduction system that was used in

the OPEVAL. The specific objectives of OT-III include: testing of fixes or corrections that were incorporated, completion of any deferred or incomplete Initial Operational Test and Evaluation (IOT&E), and evaluation of any new tactics development.

OT-IV is the second phase of FOT&E, and it is conducted on the production system. One of the initial objectives of OT-IV is the demonstration of the achievement of program objectives for production system operational effectiveness and operational suitability, especially reliability, maintainability and logistic supportability. Additional objectives are OT&E of the system in new environments, in new applications, or against new threats.

C. PRODUCTION ACCEPTANCE TEST AND EVALUATION (PAT&E)

Production Acceptance Test and Evaluation is conducted upon production items to ensure that the items procured meet the specifications of the procurement contract. Successful completion constitutes the recognition that the item fulfills the requirement for which it was produced. PAT&E is the responsibility of the Developing Agency and begins in the transition to production section of the Full-Scale Development Phase and continues through the Production and Deployment Phase [Ref. 9: p. 7-9].

The single most important message that comes out of the test and evaluation evolution is that any new acquisition

program must be capable of meeting or exceeding the real world goals expected of it in the actual or closely simulated operational environment prior to any major production commitment. The information obtained by T & E is used to give a better understanding of the system's capabilities, to identify shortcomings, to develop improvements, and to assist in designing the system's future replacements. Additionally, an important facet of the program is to verify the ability to support and maintain the system and to develop requirements for training personnel in the operation of the system.

IV. THE SERVICES' INDEPENDENT TEST AGENCIES FOR OPERATIONAL TEST AND EVALUATION

Having established a base from which to work, each individual service will be reviewed to see how they are structured to handle the requirement for independent test and evaluation. However, before this is undertaken, the issue of what prompted the drive for the independent test agencies will be presented.

During the period prior to the President's Blue Ribbon Defense Panel Report (released on 1 July 1970), defense system planners and developers received little attention from Congress on the methods they used to develop and test the new systems. At that time, most of the controversy surrounded the actual need for the weapon system and the cost of placing the weapon system into the defense inventory. The concern of whether the weapon system could in fact perform to the designated specifications or was actually ready for production was very small outside the Department of Defense. Most of this lack of concern can be attributed to a general feeling of satisfaction within the Congress that the government research, development, test, and evaluation (RDT&E) side had been very successful since the United States was winning the intercontinental ballistic missile and space race. It was during this period in time that the U.S. placed a man on the Moon. Another factor that kept the Congress's

attention was the war in Vietnam. With the change of Presidents and a change in attitudes toward economic conditions and domestic issues, the Congress intensified its scrutiny of Defense expenditures, in particular the area of major weapon system acquisition. It was this intensification by the Congress that brought about the dramatic change in the military services' test and evaluation policies.

The President's Blue Ribbon Defense Panel (BRDP) was one of the major driving forces behind the one hundred and eighty degree change in attitudes. In the BRDP report the Department of Defense's operational test and evaluation practices were specifically addressed as a significant problem area. The following excerpt points out the concern of the panel:

There has been an increasing desire, particularly at the OSD level, to use data from OT&E to assist in the decision-making process. Unquestionably it would be extremely useful to replace or support critical assumptions and educated guesses with quantitative data obtained from realistic and relevant operational testing.

Unfortunately, it has been almost impossible to obtain results which are directly applicable to the decision or useful for analysis. Often, test data do not exist. When they do, they frequently are derived from tests which were poorly designed or conducted under insufficiently controlled conditions to permit valid comparisons. It is especially difficult to obtain test data in time to assist in decision-making. Significant changes are essential if OT&E is to realize its potential for contributing to important decisions, particularly where the tests and the decisions must cross Service lines. [Ref. 10: p.59]

Secretary Packard, then the Deputy Secretary of Defense, was the driving force within the Department of Defense for changing the test and evaluations policies. He personally sent a series of memoranda to the Services in which he requested that the Services arrange for OT&E to be managed and conducted by an independent agency separate from the developing command and which reported their results directly to the Chief of the Service.

The formal directive came in the form of two Department of Defense Directives (DODDs). The first was Department of Defense Directive 5000.1, which officially tied OT&E with the Joint Requirements and Management Board (JRMB), then called DSARC, Milestone III decision point.

Test and evaluation shall commence as early as possible. A determination of operational suitability, including logistic support requirements, will be made prior to large scale production commitments, making use of the most realistic environment possible and the best representation of the future operational system available. The results of this operational testing will be evaluated and presented to the DSARC at the time of the production decision. [Ref. 11: para.III, C.1]

The second directive was DODD 5000.3, which provided additional and more specific test and evaluation policy guidance than that of DODD 5000.1.

In each DOD component there will be one major agency separate and distinct from the developing/procuring command and from the using command which will be responsible for OT&E and which will:

- a. Report the results of its independent test and evaluation directly to the Military Service Chief or Defense Agency Director.

- b. Recommend directly to its Military Service Chief or Defense Agency Director the accomplishment of adequate OT&E.
- c. Insure that the OT&E is effectively planned and conducted [Ref.128: para. IV, C.1].

The stage had now been set with the official Office of the Secretary of Defense direction for the formation of an independent testing agency within each service.

The Blue Ribbon Defense Panel Report should be considered the catalyst, which resulted in a major change in how the Services viewed their test and evaluations activities. The most notable change came in the area of OT&E. An examination of how each branch of the service incorporated this new philosophy follows.

A. ARMY

During the period 1962-1971, the testing of systems and equipment under development and in-process of acquisition by the Army was accomplished almost totally within the Army Material Command (AMC). The Army Material Command assigned the test responsibilities to the Commanding General, United States Army Test and Evaluation Command (TECOM).

As the Army's principal material testing organization, the Test and Evaluation Command was assigned the basic mission of providing the decision makers with unbiased independent appraisals of Army material. The Army chartered the

TECOM to reduce the time frame between design and production and to eliminate duplication of effort through integrated testing and better coordination.

To accomplish what the charter mandated, TECOM employed both engineering tests and service tests. Engineering tests were conducted to determine if the system really met the material need. Service tests examined the human interface with the system. These tests determined the equipment's suitability for the Army's use and for release to production. Actual operational units were employed to conduct tests in a tactical environment and in general possessed many of the characteristics of present OT&E practices. However, these tests were often conducted after the management decision to produce the system in numbers and even after the deployment for Army operational use.

Since the Test and Evaluation Command was affiliated with the Army's Material Command developers, a new and independent command was necessary in order to meet the requirements of the Department of Defense Directive. As a result, the Operational Test and Evaluation Agency (OTEA) was established on 25 September 1972 at Fort Belvoir, Virginia. Through their charter from the Secretary of the Army, OTEA was given the management responsibility for major and non-major systems. [Ref. 13: pp. C-1 - C-3]

The Commanding General of OTEA reports to the Chief of Staff of the Army. The mission and functions of OTEA are assigned by Army Regulation (AR) 10-4, "U.S. Army Operational Test and Evaluation Agency". The mission of OTEA "is to manage all user testing, operational testing (OT), force development testing and experimentation (FDTE), and joint user testing directed by the Office of the Secretary of Defense" [Ref. 14: p. 2]. The specific tasks which are assigned to OTEA are summarized as:

- a. Plan, direct and evaluate the operational testing of all major and selected non-major systems.
- b. Coordinate the operational testing of other non-major systems.
- c. Manage major and coordinate non-major FDTE.
- d. Coordinate Army participation in the planning and execution of Joint OT&E.
- e. Provide a strong focal point organization to keep the Developing Agency (DA) and the Office of the Secretary of Defense (OSD) fully informed on the Army's OT&E needs and accomplishments.

The original manning level of OTEA was set at 120 personnel, which included: 53 officers, 2 enlisted, and 65 civilians. In 1975, the strength was increased to 250 personnel with 125 officers, 20 enlisted, and 105 civilians. Today, its strength is 256 personnel with 122 officers, 8

enlisted, and 126 civilians [Ref. 15]. Figures 3 shows OTEA's relationship within the Army's Test and Evaluation organization. Figure 4 is the organizational chart for OTEA.

When the Operational Test and Evaluation Agency receives a system from AMC for T&E, it either appoints its own test director and team or tasks the Force Command (who is responsible for the continental U.S. Army Divisions) along with the Material Development and Readiness Command and/or the Training Doctrine Command to perform the testing. This decision is made based upon the size and importance of the program/system to be tested. OTEA's role when it retains a system for testing is to furnish three to five of its personnel to fill key positions on the team such as the Deputy Director for the systems OT, the Chief Analyst, the Chief Data Collector, and the Chief Controller. TRADOC, representing the user, provides the appropriate assistants in the areas of conceptual expertise. The remaining positions are filled by the testing command. If the program/system OT&E is tasked to an organization other than OTEA, OTEA mainly evaluates the data generated by the testing command. OTEA is currently directing/managing OT&E for 62 major and 250 lesser category non-major systems [Ref. 16].

ARMY ORGANIZATION FOR MATERIAL ACQUISITION & TEST

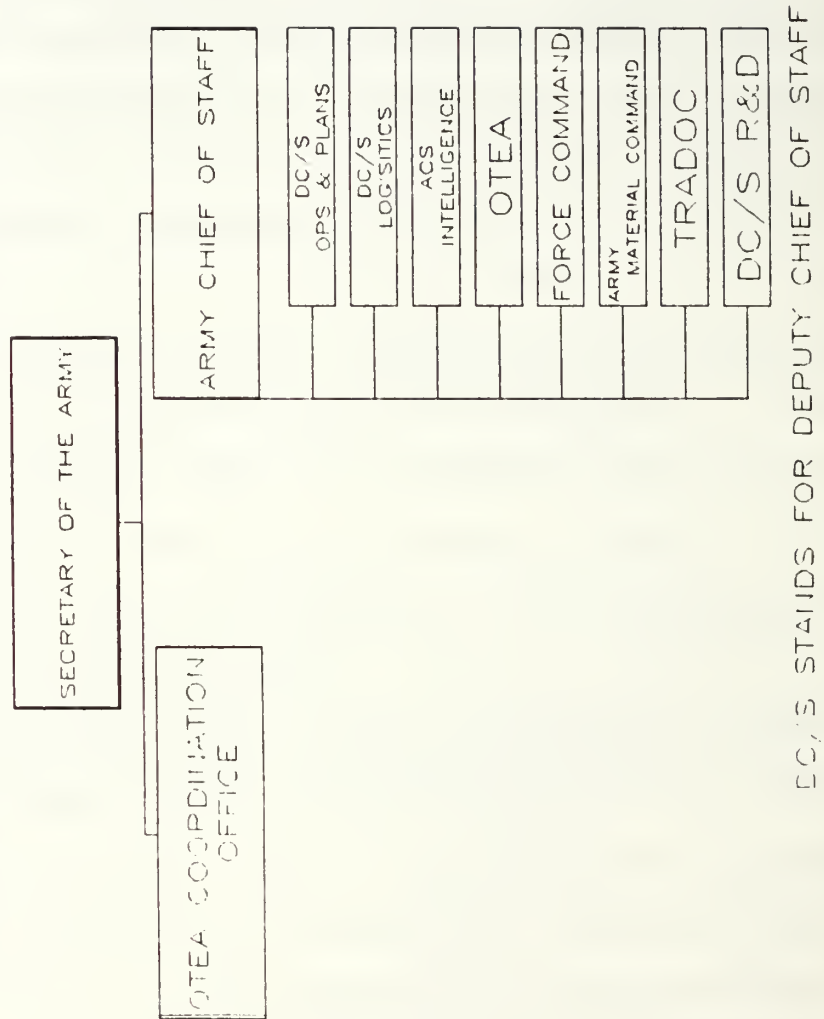


Figure 3. Army Organization for Material Acquisition and Test

OTEA ORGANIZATION CHART

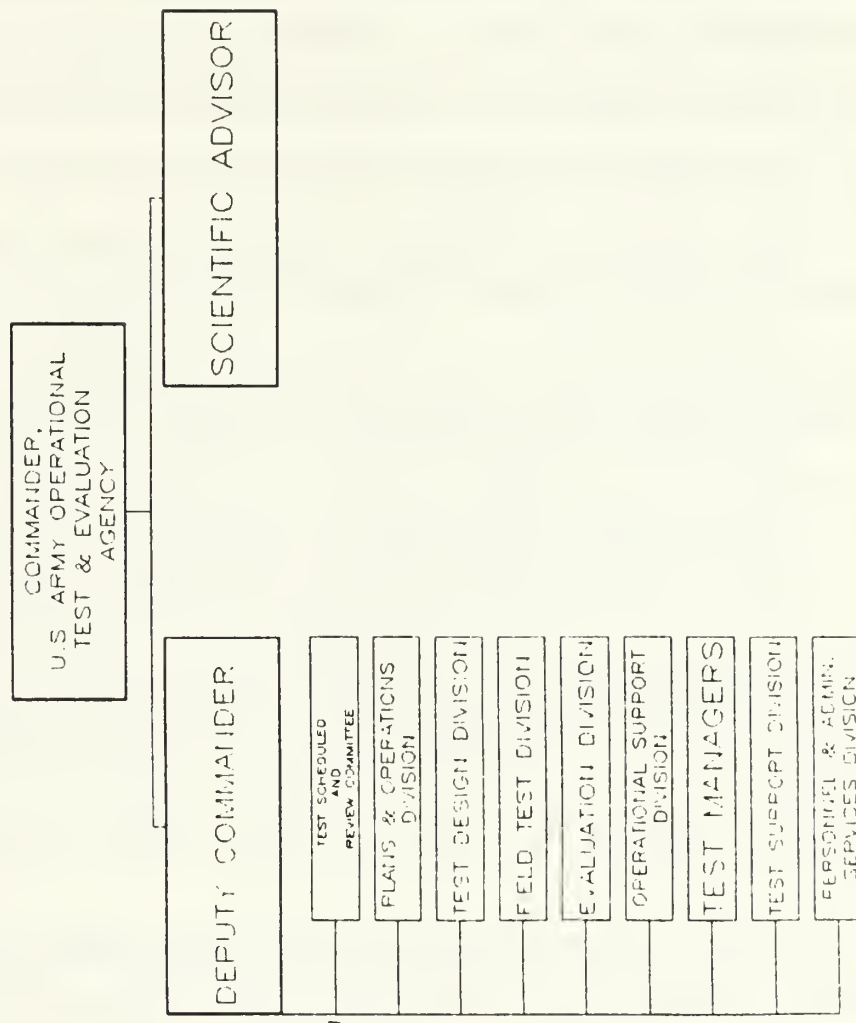


Figure 4. OTEA Organization Chart

B. AIR FORCE

In their attempt to conform to the DOD requirement, the Air Force initially tried to achieve independence in operational testing by placing the full OT&E responsibility on the user Command. Even though this was a step in the right direction, the Air Force's effort fell short of its mark and was often subject to criticism. To correct this shortcoming, the Air Force, in October of 1974, established its independent test agency calling it the Air Force Operational Test and Evaluation Center (AFOTEC) at Kirkland Air Force Base, New Mexico. AFOTEC is a separate operating agency that reports directly to the Chief of Staff of the Air Force. In addition to its headquarters at Kirkland, AFOTEC has four additional permanently established detachments at Edwards Air Force Base, California, Eglin Air Force Base, Florida, Nellis Air Force Base, Nevada, and Kapaun Air Station, West Germany. Along with these four permanent detachments there are additional field test teams at various designated sites. [Ref. 17: p.1]

The center's headquarters and field teams include operational, technical, analytical and test specialists. The field test teams conduct their test at the selected sites and from the results prepare the formal reports. These field teams are composed of personnel from the Air Force Test and Evaluation Center along with personnel from the operating

and support commands who will eventually receive and utilize the systems in every day operation.

The Air Force Operational Test and Evaluation Center's stated mission is "to manage the Air Force operational test and evaluation program and assess the military utility and operational effectiveness and suitability of major and designed non-major systems" [Ref. 17: p.1]. The specific tasks which are assigned to AFOTEC are summarized as:

- a. Design, direct, analyze, evaluate and report on OT&E of major and designed non-major Air Force systems.
- b. Designate the Deputy Test Director and provide (with augmentation from major commands) the OT&E team for combined DT&E/IOT&E programs retained by AFOTEC.
- c. Monitor all non-major system OT&E conducted by the major commands (e.g. TAC, SAC, MAC) through review and approval of tests plans and review of comments on the test reports.
- d. Develop policy recommendations for Headquarters, United States Air Force approval and subsequent implementation by all major commands.
- e. Act as spokesman to the Joint Requirement and Management Board (JRMB) on matters pertaining to OT&E.
- f. Support Congressional requests for OT&E information on weapon systems for which procurement funds are being requested. [Ref. 17: p.1]

Since becoming operational, the manning of AFOTEC has increased from the initial authorization of 208, to the present strength of 677. This manning level includes 477 officers, 90 enlisted, and 110 civilians. AFOTEC is

additionally augmented by 2500 personnel from the previously mentioned operating and support commands [Ref. 18] The organization of AFOTEC is similar to that of the Army's OTEA. Figure 5 shows the overall relationship of AFOT&E within the Air Force, and Figure 6 is the organization chart of AFOTEC.

Air Force Operational Test and Evaluation Center is currently managing OT&E for 65 major and designed non-major programs. In addition, the center is presently monitoring 240 operational test efforts being done by other major USAF commands. [Ref. 19]

C. NAVY

The Navy had an easier time than its sister Services in coming up with a test agency that was independent of the developer, since the Navy already had one in existence. This command is call the Operational Test and Evaluation Force (OPTEVFOR).

OPTEVFOR can trace its origin to the final months of World War II. During the Okinawa campaign, the surface forces of the Navy came under a sustained concentrated attack by Japanese kamikaze aircraft. These suicide attacks took a great toll in ships and personnel, and a means to deal with the threat was urgently required. In July of 1945, the Composite Task Force, U.S. Atlantic Fleet was formed and

Air Force Organization For T&E

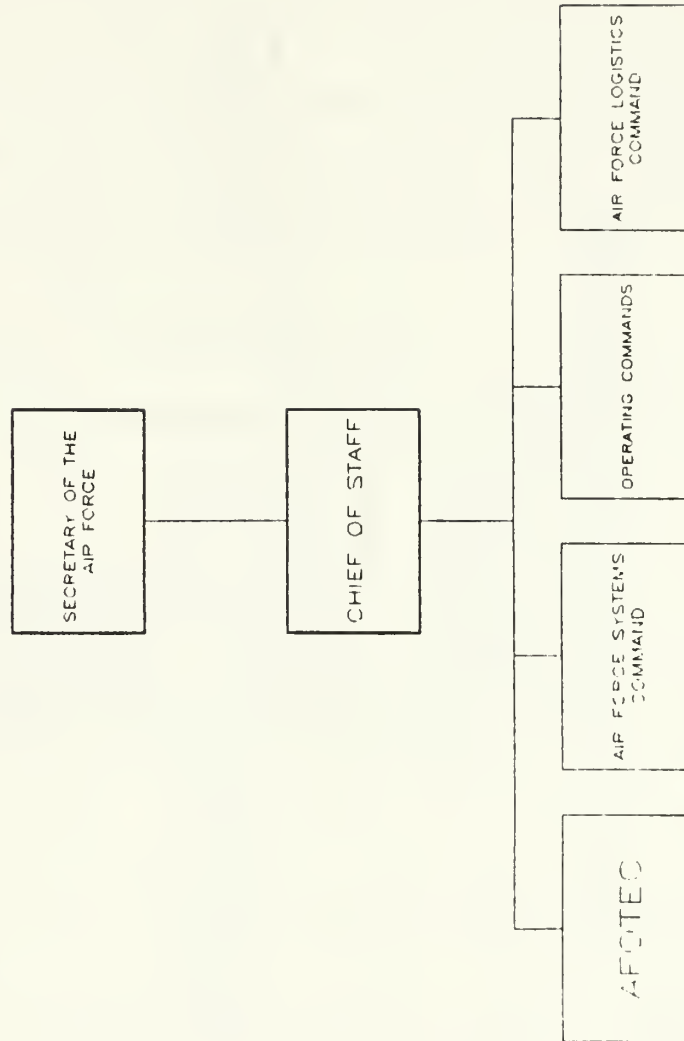


Figure 5. Air Force Organization For T&E

AFOTEC ORGANIZATION STRUCTURE

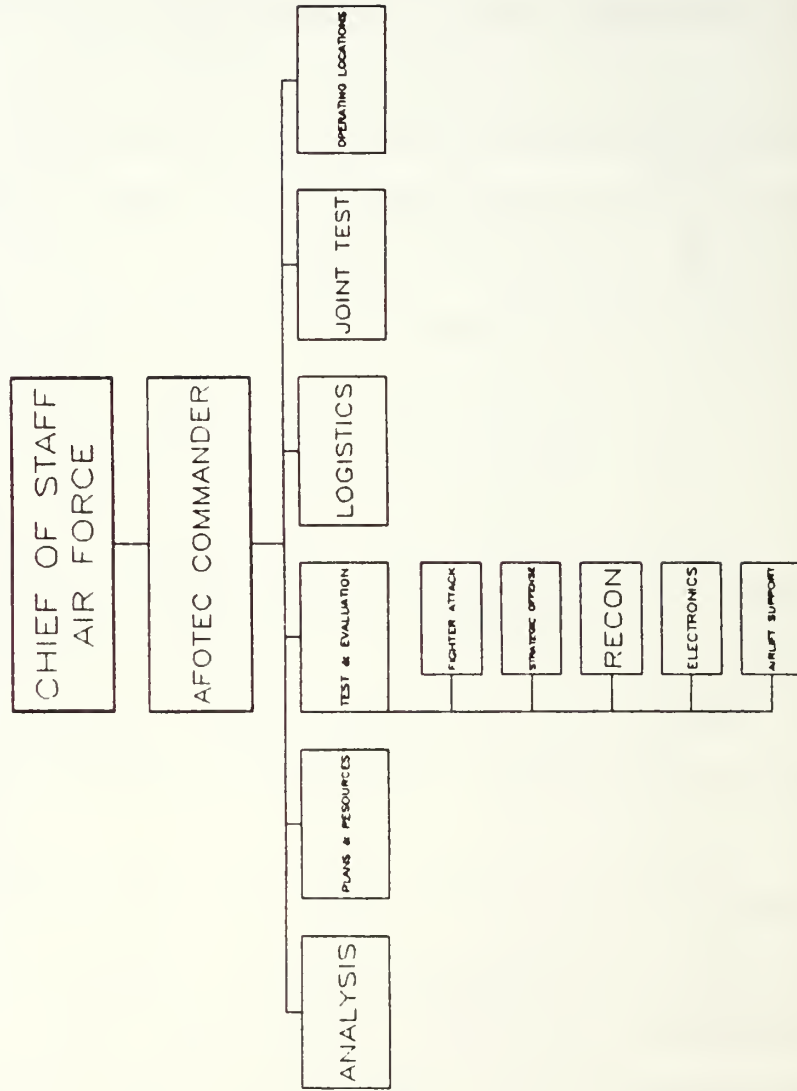


Figure 6. AFOTEC Organization Structure

tasked with the development and evaluation of methods to combat such attacks. This was the origin of the Navy's independent test agency. [Ref. 13: pp.D-1 - D-3]

In the following years, changes were made to the name of the command and to the assigned mission and tasks. These changes resulted in a wider scope of responsibilities and expanded capabilities in test and evaluation. Additionally, a similarly structured command was formed on the west coast for the Pacific Fleet.

To achieve the desired independence which was suggested in the Blue Ribbon Defense Panel report and required in the DOD directives, OPTEVFOR had to make a shift in its emphasis. This change in mission orientation was accomplished in the period between late 1971 and middle 1972. While the reorganization did not involve an appreciable organizational restructuring or an increase in manpower allocation, it did require a different and more expensive mix of personnel. The Navy's "hands-on" operational testing concept required operational officers and highly skilled noncommissioned officers that were familiar with the current missions, tactics, policies, and procedures. [Ref. 13: pp. D-1 - D-3]

The Operational Test and Evaluation Force is now under the direct command of the Chief of Naval Operations (CNO) for the conduct of OT&E. The organizational relationship

that OPTEVFOR has with the DOD/NAVY can be seen in Figure 7. The command headquarters for OPTEVFOR is located at the Norfolk (Virginia) Naval Base. For the Pacific area of operations, a separate staff under the Deputy COMOPTEVFOR is located at the Naval Air Station, North Island, San Diego, California. The function of the Deputy COMOPTEVFOR is to act as the representative of OPTEVFOR in matters in the Pacific area and, when directed, with west coast operational commands (e.g. COMNAVAIRPAC, COMNAVSUFPAC).

The mission of OPTEVFOR is assigned by the CNO and is "to operationally test and evaluate specific weapon systems, ships, aircraft, and equipments, including procedures and tactics, where required; and, when directed by CNO, assist development agencies in the accomplishment of necessary Developmental Test and Evaluation" [Ref. 20: p. 1]. The specific tasks which are also assigned to COMOPTEVFOR by the CNO are summarized as:

- a. Function as an independent test agency for OT&E under the command of the CNO.
- b. Serve as principal advisor to the CNO for all Department of the Navy OT&E matters.
- c. Present results of OT&E to the JRMB at Milestone III (production decision) review and to other reviews as directed by the CNO.
- d. Conduct operational tests on weapon systems including ships and aircraft. Evaluate operational effectiveness, suitability, and capability, reporting the results to the CNO.

DOD, NAVY ORGANIZATION FOR T&E

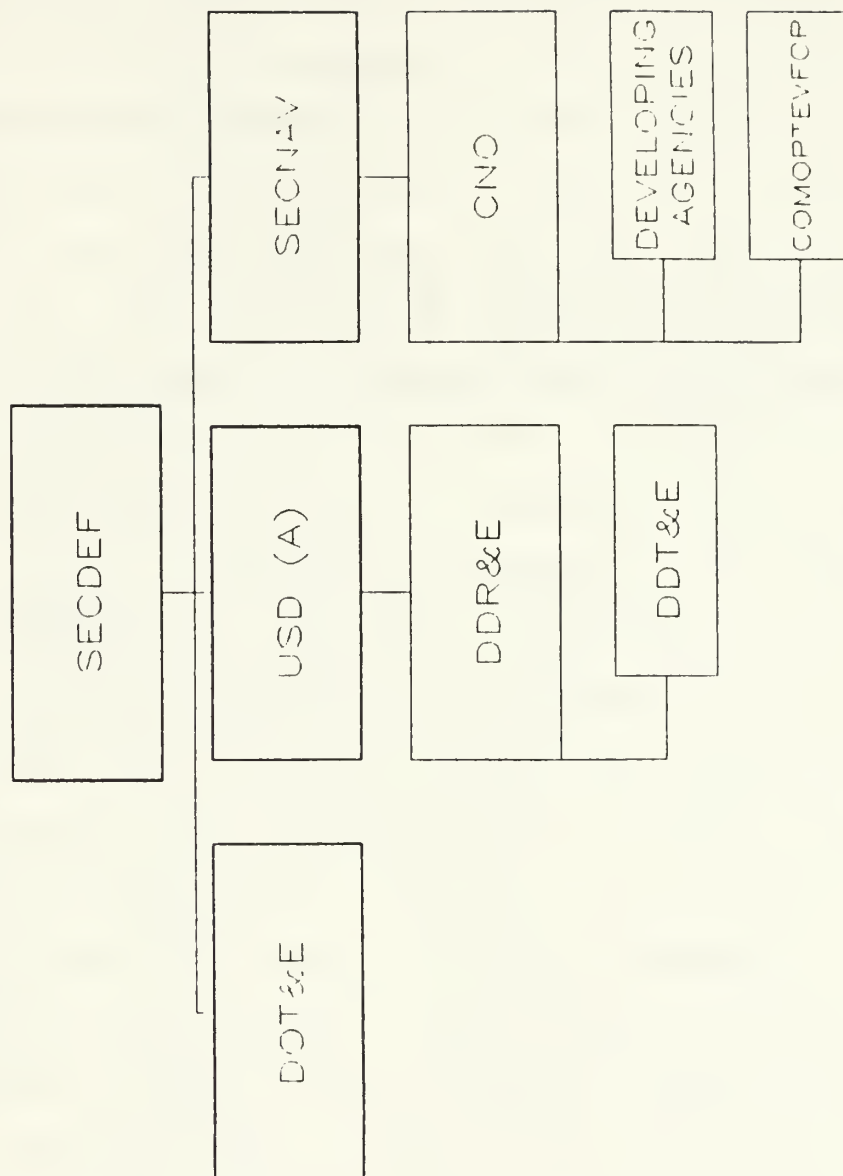


Figure 7. DoD/Navy Organization for T&E

- e. Assist development agencies in DT&E, including fleet support, as required, reporting the results of such assists and an assessment of the system tested.
- f. Review and evaluate the T&E planning for new weapons systems to address and resolve critical issues and report the findings to the CNO [Ref. 20: p. 1].

The current authorized personnel strength of OPTEVFOR is approximately 1400. Its Norfolk Headquarters has 268 personnel, including 119 officers, 119 enlisted, and 30 civilians [Ref. 21]. This represents only about one-fifth of the authorized positions in OPTEVFOR. The other personnel are spread across the subordinate command (DEPCOMOPTEVFOR), organic aircraft squadrons (VX-1,VX-4,VX-5), and the Sunnyvale detachment. Figure 8 shows the current organizational arrangement of OPTEVFOR.

It is interesting to note that when OPTEVFOR does OT&E on a ship or submarine it preforms the tests in a very similiar manner to that of the Army or Air Force. OPTEVFOR usually sends a detachment of their people to the ship/submarine to direct the testing, but utilizes that unit's precommissioning crew instead of there own personnel for conducting operations. In the case of an aircraft or related hardware, OPTEVFOR uses the total in-house concept, using only their own personnel to test the item.

Operational Test and Evaluation Force is presently managing OT&E for 92 major and non-major systems [Ref. 20].

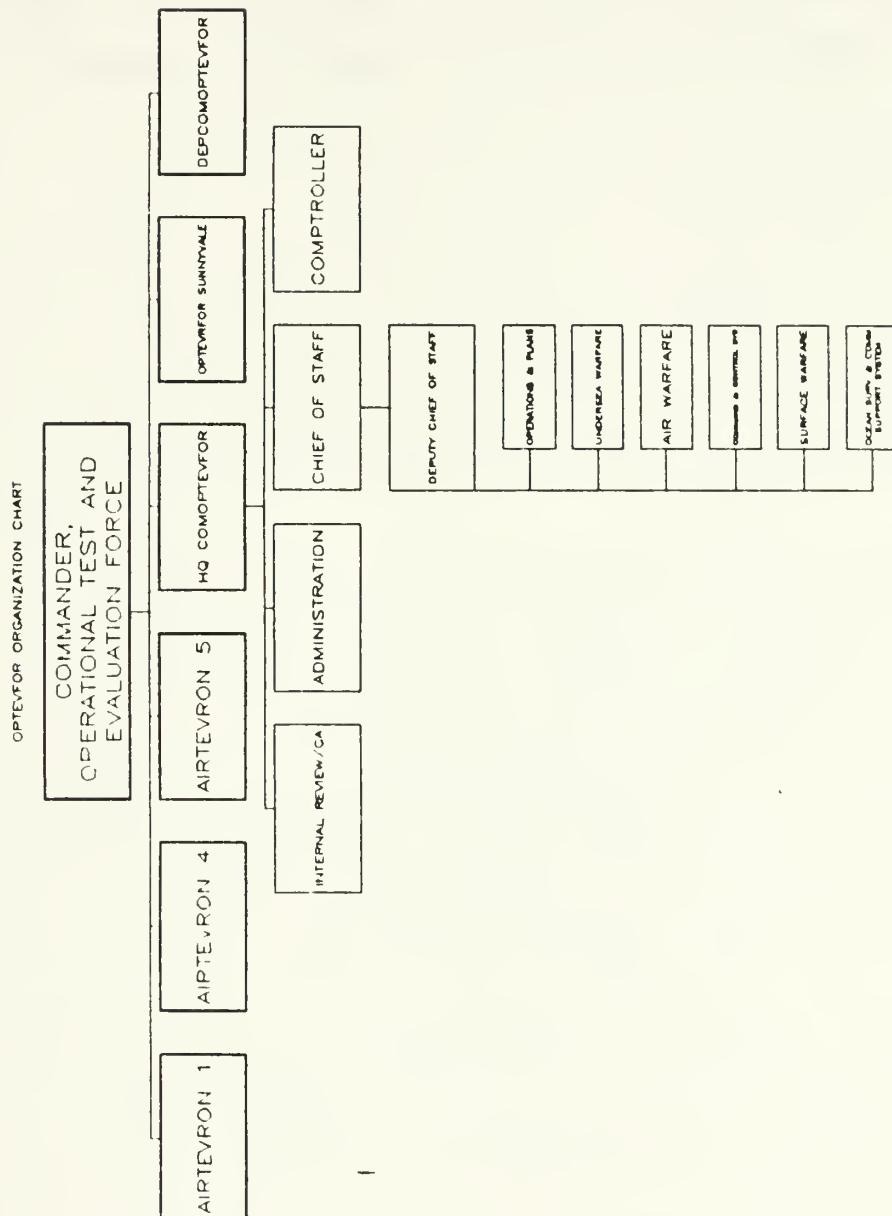


Figure 8. OPTEVFOR Organization Chart

In this chapter the services' independent test agencies have been reviewed. Their organizational relationship and methods of performing OT&E have been highlighted. A summary of these relationships and methods are provided in Appendix B.

V. THE ADVANTAGES AND DISADVANTAGES OF THE SERVICES' INDEPENDENT TEST AGENCIES

In response to DoD directives, each service has elected a different approach in their organizational structure for performing OT&E. Both the Army and the Air Force chose to participate much more closely with the Developing Agency (DA). Both OTEA and AFOTEC are small organizations which plan, direct, and control the operational testing, yet they leave the actual testing to the user command, normally utilizing the unit programmed to receive the first operational system.

The Navy, on the other hand, has elected to use the total in-house concept in the case of aircraft systems' testing and evaluation. OPTEVFOR acts as a surrogate for the user by utilizing their own independent test facilities and assets to conduct tests on the systems. Additionally, OPTEVFOR believes that the involvement with the DA will jeopardize their objectivity with the system [Ref. 22].

In trying to answer the question as to whether OPTEVFOR needs be to restructured, it will be best to address the advantages and disadvantages of each service's independent operational test agency.

OPTEVFOR's strongest feature is their insistence on total independence in order to maintain their objectivity in

the T&E process. Currently, OPTEVFOR insists that in order to maintain their independence or objectivity, interaction between OPTEVFOR and the DA has to be kept to a minimum. Stated another way, the issue is independence versus cooperation, with OPTEVFOR placing more weight on the side of independence. [Ref. 22]

It is this independence that is considered their strength because they do not have to concern themselves with the developer trying to twist their arm in an attempt to get a favorable decision. Additionally, by making themselves the tester and not using the operational commands, they are able to address the system with more objectivity since they do not have a vested interest in the system.

OPTEVFOR's insistence on independence is also their biggest disadvantage. This reluctance has been the focal point in numerous studies, such as the the President's Blue Ribbon Panel Report (BRDP) in 1970. The BRDP believed that it is important to perform OT&E on an operationally configured production system. However, if the OT&E process only commences at OPEVAL, it misses most of the opportunity to influence the product during its development on behalf of the operational forces. [Ref.10: p. 88] The Defense Science Board on 17 February 1977, published a study stating that "interaction among development test and evaluation and operational test and evaluation, in addition to the close

contact with the users, pays very important dividends in terms of money, time and operational suitability" [Ref. 1: p. 7]. Both these reports, along with others, indicate that a working relationship between the DA and the independent test agency is critical to the acquisition process.

Since OPTEVFOR does not actively participate in the system, this tends to create the "gotcha" syndrome [Ref. 25]. When a system comes from TECHEVAL to OPEVAL, there is a possibility that it may not pass due to a change in OPTEVFOR test criteria. A weapon is developed to meet a stated operational requirement (OR). This requirement can be affected by funding reductions, schedule delays and contract disputes, in addition to changing threats, new weapons and new tactics. As a result, the DA develops a system that fully meets the requirements of the original OR, but as a result of the aforementioned ongoing changes, it falls short of the current OT&E criteria. Since OPTEVFOR does not interface with the developing agency, it is extremely likely that the DA might not be aware of these changes. The end result is the system is not ready for OPEVAL due to test criteria changes. It is at this point that the "gotcha" takes place.

Another study done in the summer of 1984 by the Naval Research Advisory Committee (NRAC) further illustrates what the results can be when there is little or no interface

between OPTEVFOR and the DA. The committee reviewed a random sample of 142 of OPTEVFOR's OPEVALS that were conducted between 1975 and 1982. The results of the study showed that 20% failed OPEVAL outright and 47% conditionally passed. These systems were assessed for their operational effectiveness and suitability. Of those that failed, the majority of them failed the suitability aspect of the test. [Ref. 25] The question which arises here is, how can a system get this far in the process and then fail? This is like having a student advance all the way through the education system and then give this student a literacy test and find out that the individual is unable to read and write.

In the author's opinion, the number of failures in OPEVAL could be attributed to OPTEVFOR insistence on maintaining their independence. With increased communication, OPTEVFOR could alert the development agencies to the changes in the suitability requirements much earlier in the acquisition process. This in turn would reduce the number of failures. By waiting until just before the system is ready to enter production to communicate, the only recourse if a discrepancy is discovered is to fail the system.

On the other side of the spectrum, a strong point of both the OTEA's and AFOTEC's arrangement is their increased

ability to communicate with the DAs. Instead of representing the user as in the case of OPTEVFOR, both OTEA and AFOTEC believe in getting the user involved at a very early stage in the OT&E process. OTEA uses a central group comprised of their personnel and the user to test a system. The Air Force, on the other hand obtains the personnel needed to test the system from the user and support commands on either a Temporary Additional Duty (TAD) or Permanent Change of Station (PCS) basis. These personnel are then sent to AFOTEC to support the program.

OTEA has recently implemented a new plan called Continuous Conception Evaluation (C2E), which has advanced the idea of continuous independent evaluation through the program's acquisition cycle. Differing from OTEA's previous methodology, C2E begins at a much earlier point in the acquisition process and follows the system past the production phase of the process. The data generated from models, simulations, contractor/government testing, and operating trials is now being collected and correlated for future use. This information will help to provide trends, projections and inputs for existing and future projects. [Ref. 23: p.6]. Thru C2E, OTEA is now in essence tracking a major system from inception to retirement from inventory. Figure 9 shows the major projects that are currently under C2E [Ref. 23: p. 10].

SYSTEMS CURRENTLY IN C2E

15 APRIL 1986

TOTAL: 56

AIR DEFENSE		ARMOR		AVIATION	
1	ATM/JATM	1	ABRAMS	1	AH64
2	CHAPARRAL RSS	2	AFV	2	AHIP
3	FAADS	<u>COMMAND & CONTROL</u>		3	LHX
	FAAD C2I	1	ACCS	<u>SIGNAL</u>	
	LOS-R (PMS)	2	MCS	1	CSCE
	LOS-F	(AFATDS, ASAS, FAAD C2I AND		2	DGM
	NLOS	TACCS LISTED ELSEWHERE)		3	I S/A AMPE
<u>COMBINED ARMS AD</u>		<u>INFANTRY</u>		4	MICC
4	MARK XV IFF	1	AAWS (L, M, H)	5	MSE
5	MSAM	2	BFV	6	PLRS/JTIDS HYBRID
6	PATRIOT P3I	3	STINGRAY (DEW)	7	RECS
7	STINGER RMP	<u>INTELLIGENCE</u>		8	SCOTT-MILSTAR
<u>ARTILLERY</u>		1	ASAS	9	SINCGARS
1	AFAS	2	IEW UAV	10	SST
2	AFATDS	3	JSTARS	11	AN/TRC 170
3	ARMY TACMS	<u>COMBAT SUPPORT</u>		12	AN/TTC 39A
4	ETAS	1	ACE	13	ULCS
5	HIP	2	C17A	<u>STRATEGIC</u>	
6	MLRS TGW	3	HMMWV	1	SATKA (AOA, TIR, SRHIT)
7	PERSHING II	4	IFTE	2	KEW (ERIS, HEDI, LEDI)
8	RPV	5	M88 PIP	3	DEW (NPB, FEL)
9	SADARM	6	TACCS	4	SA/BM (C3)
10	XM119	7	XM40	5	WIS/AWIS
				6	NAVSTAR GPS

Figure 9. Systems Currently in C2E

AFOTEC is similar to OTEA in that it establishes a close liaison with the DA. The Air Force's new emphasis on the operational requirement of a system has resulted in a even closer working relationship between AFOTEC and the DAs. The DA is now continually kept advised of any changes in the system's operational requirements by AFOTEC. The obvious benefit is that there are no surprise OR changes when the system enters OPEVAL. Additionally, the Air Force, in an attempt to shorten the acquisition process, is trying to use DT&E to help verify the operational performance of a system. A reduction in duplicative testing can be achieved since some of these tests will not have to be repeated under OT&E. Presently being used on the B-1 bomber, this approach is considered a significant change and is still in the very early stages of evolution by the Air Force. [Ref. 24: p. 5]

This close working relationship of OTEA and AFOTEC with the DA and user commands can shorten the acquisition process. By alerting the system to changes and, in the case of the Air Force, reducing duplicative efforts in testing the total time required to field a system is reduced.

The underlying reason behind the establishment of the independent operational test agency (ITA) was to assure the independence in the testing of a system. However, one of the biggest disadvantages that can result from too close a working relationship between the ITA and the DA/user command

is a loss of objectivity. It is very hard to maintain objectivity when so much time has been spent with the people developing the system. Both OTEA and AFOTEC have to contend with pressures from not only the DA, but also the user, both of whom are trying to get the system into production. The DA wants the system to enter production because this makes him look good. The user wants the hardware since it is perceived to be better than that which he has presently. As a result, he wants the system to do well in testing as this would expedite the fielding of the new system. If the ITAs bends to their wishes, the result could be a system entering production that might require extensive after-production modifications to make it function properly. Any savings in time and costs which were gained by the ITAs interfacing are now removed by the additional time and costs required to fix the system's shortcomings.

In summation, this chapter has illustrated that OPTEVFOR's strongest point, their insistence on independence, is also their weakest feature. In their effort to insure their objectivity, OPTEVFOR has missed the opportunity to influence the system's development on behalf of the operational forces. Additionally, their lack of cooperation can add to the length of the acquisition process. By not keeping the DAs appraised of changes in the OR, it is possible that a system might have to go

back through development to correct the shortcomings introduced by the new requirements. On the other hand, OTEA's and AFOTEC's best feature is their strong relationship with the DA. This relationship can correct OPTEVFOR's most prevalent shortcomings, however, it in itself can introduce problems if carried too far, resulting in the release of a system that is not yet ready for production.

VI. CONCLUSIONS/RECOMMENDATIONS

Before we put a weapon system in the hands of our troops we should ensure that it performs its combat mission, not that it simply meets contract specifications. . . . American service personnel have a right to expect that the government will provide them with the necessary tools to do their job. [Ref. 26: p. 28]

This statement made by Representative C. E. Bennett, is an excellent summation of what is expected from OT&E in the acquisition process. The purpose of the independent test agencies is to determine whether the weapon system fulfills the desired function in an operational environment.

In the introduction, a statement from the Summer 1984 NRAC report indicated that restructuring would enormously reduce the size and cost of OPTEVFOR. In addition, the report stated that the user's inputs could be introduced into the process on an earlier and continuous basis [Ref.2]. The first part of this statement is appealing, however the preceding analysis of operational test agencies indicates that there is strong reason to believe that changes in operating policy, not the actual structure of OPTEVFOR, should be made.

The present manning levels of OTEA and AFOTEC are in actuality about the same or even greater than OPTEVFOR. This analysis of the manning levels is based on counting the personnel that OTEA and AFOTEC utilize from other commands for support of their testing. By comparing these numbers against

OPTEVFOR's total complement of officers, enlisted and civilians, it becomes evident that the Army and Air Force OT&E manning effort is not less than the Navy's. For example, AFOTEC's level of 2500 supporting personnel is almost double that of OPTEVFOR total in-house complement of 1300 personnel.

Considering the costs of those services supplied by the other supporting commands, it appears that operating costs of each ITA are comparable. In essence, there is very little difference between the size and cost of each ITA if the supporting commands for OTEA and AFOTEC are included in the analysis. The actual cost of each ITA and its supporting command was beyond the scope of the research for this thesis, however, the potential value of this information merits further study.

The statement that the users inputs need to be provided earlier and on a continuous basis can be viewed as a result of OPTEVFOR's philosophy and not its existing structure. Until recently, OPTEVFOR has been resistant to the idea of interacting more closely with the DAs, so that it could maintain objectivity. The importance placed by OPTEVFOR on maintaining objectivity has changed somewhat with the new commanding officer (COMOPTEVFOR). An examination of the findings of the Summer 1984 NRAC report reveals a change in

relationship between OPTEVFOR and the DAS [Ref. 25]. It appears that the new COMOPTEVFOR endorses increased liaison with the DAS.

In the past, when a system arrived for the OPEVAL that did not meet the test criteria it would immediately fail. Now, if a problem is discovered, instead of failing the system outright, COMOPTEVFOR will call his counterpart at the DAS and inform him that the system is not doing well. This allows the DAS to remove the system from OPEVAL and correct the deficiencies. This new approach not only keeps the problems in-house and away from the public, but it also fosters greater cooperation.

This cooperative relationship should not begin just at the time and point that a system enters OPEVAL. It is not enough to just advise the DAS that the system is not doing well and needs some correction. The Navy needs to strongly encourage the early, continuous, and positive participation of all key players as described in OPNAVINST 3960.10. The difference between the operational test requirements and that of development testing mandates closer coordination between the Navy's independent test agency and its developing agencies. These organizations need early and clear definition of the test objectives, criteria and the standards. Once these conditions can be agreed upon, they must be kept current throughout the program to minimize the necessity for repeat development and testing. Failure to do

so can result in unnecessary delays and higher costs in the acquisition of fleet-ready weapon systems.

Another area outside the scope of this research is the cost associated with having to send a system back through a part of the acquisition process because it fails OPEVAL. There are undoubtedly increased costs, however the magnitude of this problem was not pursued. This subject has potential value in determining the real efficiency of the OT&E effort and merits further investigation.

A loss of independence in operational test is not being advocated nor is inference being made that objectivity is not important. The real key to effective and efficient OT&E is meaningful communication among the participants in the acquisition process. If the test requirements are coordinated and discussed by all parties, then conflict may be reduced to minor proportions or eliminated altogether.

OPTEVFOR should not change its existing structural arrangement, since it has demonstrated that this was not where the problem exists. Instead, OPTEVFOR needs to expound upon the new movement of increased communication with the DAs. The end result of this increased communication will be a vastly improved independent test agency that may ameliorate the potential of an inadequate system reaching the fleet. The Navy can neither afford

the development of systems that do not meet the fleets needs, nor can they afford the publicity that results in a produced system that fails in the fleet.

APPENDIX A: GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ACAT	Acquisition Category
AFOTEC	Air Force Operational Test and Evaluation Center
AFR	Air Force Regulation
AFSC	Air Force Systems Command
AMC	Army Material Command
AR	Army Regulation
ASARC	Army System Acquisition Review Council
ASD(A&L)	Assistant Secretary of Defense (Acquisition and Logistics)
ASN(R&D)	Assistant Secretary of the Navy for Research and Development
BIS	Board of Inspection and Survey
BRDPR	Blue Ribbon Defense Panel Report
CDEC	Combat Development Experimentation Command
CNO	Chief of Navy Operations
COMOPTEVFOR	Commander, Operational Test and Evaluation Force
CSA	Chief of Staff Army
CSAF	Chief of Staff Air Force
CTP	Coordinated Test Program
D&V	Demonstration and Validation
DA	Developing Agency
DCP	Decision Concept Paper (NAVY) or Development Concept Paper (ARMY)

DCP/ICP	Decision Coordinating Paper/ Integrated Coordinating Paper
DCSRDA	Deputy Chief of Staff Research Development and Acquisition
DDT&E	Deputy Director of Defense Research and Engineering, Test and Evaluation
DDR&E	Director of Defense Research and Engineering
DEPCOMOPTEVFOR	Deputy Commander Operational Test and Evaluation Force
DoD	Department of Defense
DoDD	Department Of Defense Directive
DOT&E	Director, Operational Test and Evaluation
DSARC	Defense Systems Acquisition Review Council
DT	Development Testing
DT&E	Development Test and Evaluation
FDTE	Force Development Testing and Experimentation
FOT&E	Follow-on Test and Evaluation
FYTP	Five Year Test Plan
GAO	Government Accounting Office
ILS	Integrated Logistics Support
IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
JMSNS	Justification of Major Systems New Start
JRMB	Joint Requirement and Management Board
LOI	Letter of Instructions
MAC	Military Airlift Command
MAJCOM	Major Command

MASSTER	Modern Army Selection Systems Test Evaluation Review
NAVAIR	Naval Air Systems Command
OPEVAL	Operational Evaluation
OPNAV	Office of the Chief of Navy Operations
OPNAVINST	Office of Chief of Naval Operations Instruction
OPTEVFOR	Operational Test and Evaluation Force
OR	Operational Requirement
OSD	Office of the Secretary of Defense
OT	Operational Testing
OT&E	Operational Test and Evaluation
OTEA	Operational Test and Evaluation Agency
PAT&E	Production Acceptance Test and Evaluation
PCS	Permanent Change of Station
PDA	Program Decision Authority
PDM	Program Decision Memorandum
PM	Program Manager
PMP	Program Management Plan
POM	Program Objective Memorandum
PPBS	Program, Planning and Budget System
RAM	Reliability, Availability, Maintainability
RDT&E	Research, Development, Test and Evaluation
RDT&E	Research, Development, Test, and Evaluation
ROC	Required Operational Capability
SAC	Strategic Air Command

SAM	Systems Acquisition Management
SCP	System Concept Paper
SDDM	Secretary of Defense Decision Memorandum
SECDEF	Secretary of Defense
SECNAVINST	Secretary of the Navy Instruction
SOR	Specific Operational Requirement
SPO	System Program Office
TAC	Tactical Air Command
TAD	Temporary Additional Duty
T&E	Test and Evaluation
TD	Test Directive
TDP	Technical Development Plan
TECHEVAL	Technical Evaluation
TECOM	Test and Evaluation Command
TEMP	Test and Evaluation Master Plan
TRADOC	Training and Doctrine Command
USACDC	U.S. Army Combat Developments Command
USD (A)	Under Secretary of Defense for Acquisition
VX	Air Test and Evaluation Squadron

APPENDIX B: ARMY/NAVY/ AIR FORCE COMPARISON

US AIR FORCE

US ARMY

US NAVY

1. Designation of major field agency responsible for OT&E:

Air Force Operational Test and Evaluation Center (AFOTEC) HQ AF TEST AND EVALUATION CENTER

Kirkland Air Force Base
New Mexico 87115
Autovon: 244-0545
Commercial: (505) 264-0545

U S Army Operational Test and Evaluation Agency (OTEA) CG, HQ U S ARMY OPERATIONAL TEST and EVALUATION AGENCY

Falls Church VA.
Autovon: 289-2228
Commercial: (703) 756-1254

Operational Test and Evaluation Force (OPTEVFOR) COMMANDER, OPERATIONAL TEST and EVALUATION FORCE

Norfolk VA. 23511
Autovon: 564-5337
Commercial: (804) 444-5337

2. Manning Level: (authorized)

Military 567
Civilian 110

Military 130
Civilian 126

Military 238
Civilian 30

3. Reporting Chain:

Reports direct to Chief Staff of the Air Force.

Reports direct to Chief Staff of the Army.

Reports direct to Chief of Navy Operations.

4 . P r i n c i p a l directives/regulations concerning OT&E:

a. AFR 80-14 "Test and Evaluation"
b. AFR 23-36 "Air Force Operational Test and Evaluation Center (AFOTEC)"

a. AR 70-10 "Test and Evaluation During Development and Acquisition of Material"

a. SECNAVINST 5000.1 "System Acquisition"
b. OPNAVINST 3960.10 "Test and Evaluation"

b. AR 10-4 "US Army Operational Test and Evaluation Agency"

c. OPNAVINST 5440.47 "Mission and Function of Operational Test and Evaluation Force"

5. Field activities directly under OT&E Test Agency:

All facilities support and personnel support provided by designed MAJCOMS.

None. OTEA contributes deputy test director and 3 to 5 key personnel to test at the command conducting test.

a. Three Air, Test and Evaluation Sqdns (VX-1,4,and 5)
b. Deputy COMOPTEVFOR San Diego
c. New London Test and Evaluation Detachment

6. Comparison of characteristics of OT&E:

a. Development of optimum tactics, techniques, procedures and concepts.

b. Evaluation of reliability, maintainability, and operational effectiveness and suitability.

c. Testing under realistic operational conditions.

d. Accomplish IOT&E prior to first major production decision.

e. FOT&E subsequent to receipt of production items.

f. IOT&E will not obviate the need for FOT&E.

a. Representative user troops

b. Realistic operational environment

c. Provide data to estimate military utility, operational effectiveness, and operational suitability including compatibility, interoperability, reliability, availability maintainability integrated logistics support and training requirements.

d. IOT&E examines the hardware or components to provide an indication of utility and worth to the user.

a. OT&E participated in or performed by operational personnel.

b. Focuses on operational effectiveness and suitability including reliability, compatibility, interoperability, maintainability and supportability.

c. Development of optimum, operational tactics.

d. IOT&E accomplished prior to JRMB III or comparable CNO major production decision point.

g. FOT&E focuses on the operational and employment aspects of the system.

AFR 80-14

e. Examination of equipment prior to initial production decision.

f. FOT&E final check prior to acceptance.
AR 70-10

e. Assessment of operational effectiveness and suitability.

f. FOT&E conducted in operational environment by operational personnel using production systems.

g. Refine tactical employment doctrine and requirements for personnel and training.

OPNAVINST 3960.10

7. Authority for assignment of OT&E projects:

a. Chief Staff of the Air Force (CSAF)

b. AFOTEC may recommend to CSAF those OT&E projects which it or MAJCOMS should conduct.

Deputy Chief of Staff Research Development and Acquisition determines the major and non-major systems.

a. Chief of Naval Operations (CNO)

b. CNO may authorize COMOPTEVFOR to further assign projects to other commands when advantages are apparent.

8. Master test document for specific (major or selected non-major) IOT&E program:

Section 5 (Test and Evaluation) of Program Management Plan (PMP).

Coordinated Test Program (CTP)

Test and Evaluation Master Plan (TEMP)

9. Views on combined DT&E/IOT&E:

a. Operating and supporting commands participation is mandatory during development testing.

a. The OT&E process will be independent and should normally be separate from the DT&E process.

a. OPTEVFOR participates in the TECHEVAL (DT&E) which is planned, conducted by the

b. Operational inputs will be utilized in (test) planning documents developed by the implementing Command.

c. To maximum possible degree, IOT&E will be accomplished completed by operating personnel of the Operational/ Supporting Commands using realistic operational environment.

d. Where adequate test data can be secured from combined DT&E/IOT&E, combined tests may be employed. Added considerations for combined testing are costs and time (AFR 30-14).

e. Separate evaluations required from Operating/Supporting Commands in Production Decisions.

However, it may be combined where separation causes delay involving unacceptable risk or unacceptable acquisition costs (AR 70-10).

b. Testing is usually phased as DT I, II, and III and OT I, II, and III. Usually OT I is run in combination with DT I. Army attempts to keep OT II and III and DT II and III separated.

c. Each phase of OT testing results in a separate evaluation by OTEA, timed to provide evaluation to the decision body (JRMB) at decision milestones.

d. DT II, OT II, and DT III are conducted on all development items/ systems as a minimum.

Developing Agency with OPTEVFOR inputs. OPTEVFOR provides independent operational assessment to the CNO.

b. OPTEVFOR is responsible for planning, conducting, reporting OPEVAL, conducted after TECHEVAL and prior to Production Decision milestone.

10. Document chain in acquisition system:

a. ROC (formally states a Required Operational Capability)

b. Action Directives (early PMD)

c. Program Advocacy Documents

d. DCP (OT&E inputs provided by AFOTEC)

e. PMD - Initial Test Directive (OT&E

a. ROC

b. Charter for special task force

c. OTEA evaluation plan

d. Program Advocacy Document

e. DCP (OT&E inputs provided by OTEA)

f. Final Report of Special Task Force (contains plan for

a. SOR (formally states a Specific Operational Requirement)

b. Technical Development Plan (TPD)- (program advocacy document including OT&E inputs by OPTEVFOR)

c. OPTEVFOR evaluation plan

inputs provided by AFOTEC)

f. Test objectives annex to the PMD

g. HQ USAF Test Directive (Drafted by AFOTEC)

h. AFOTEC Commander's Estimate

i. AFOTEC Test Plan

j. Program Management Plan (contains DT&E, OT&E tests plans)

k. Interim Test Reports (interim evaluation)

l. Final Test Report

m. AFOTEC Commander's Summary (Final independent ops evaluation)

OT&E provided by OTEA)

g. OTEA or TRADOC Outline Test Plans

h. Test Plans

i. Development Plan (contains Coordinated Test Program of all DT and OT testing of the system)

j. OT I/DT I Test Reports (independent operational evaluation by OTEA)

k. OT II/DT II Test Reports (independent operational evaluation by OTEA)

l. OT III/DT III Test Reports (independent operational evaluation by OTEA)

d. DCP (OT&E inputs provided by OPTEVFOR)

e. Test and Evaluation Master Plan (TEMP)- (contains DT&E and OT&E plans for a specific program)

f. Project Master Plan (PMP) - (contains the TEMP)

g. TECHEVAL Plan (the developing agency's plan for DT&E)

h. TECHEVAL Report

i. OPTEVFOR's independent assessment of TECHEVAL

j. OPEVAL (OT&E) PLAN

k. OPEVAL Report- (independent operational evaluation by OPTEVFOR)

11. Commands conducting OT:

a. AFOTEC- (all major and selected nonmajor systems)

b. Designed AF MAJCOMS- (nonmajor systems)

a. OTEA- (all major and selected nonmajor systems)

b. Combat Development Experimentation Command (CDEC)- (nonmajor systems)

c. Modern Army Selected System Evaluation and Review (MASSTER)- (nonmajor system)

d. Other Major Commands (nonmajor systems)

COMOPTEVFOR

12. Commands performing evaluation of OT&E directed by Service HQ:

The command conducting OT performs the evaluation subject to review, approval, and further evaluation by AFOTEC.

OTEA performs the evaluation.

COMOPTEVFOR performs the evaluation.

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